first and second member which, upon movement of the members, at least partially compensate for the moment exerted by the first member relative to the foot part and by the second member relative to the elbow axis, the arrangement being such that thus, during use, couples acting on a number of drive means are limited.

20. (Amended) A manipulator according to claim 19, wherein the shoulder axis and the elbow axis, during use, extend substantially parallel to each other and preferably horizontally, and are located adjacent opposite ends of the first member, the gripper being rotatable about at least a first gripper axis relative to the second member, said first gripper axis preferably enclosing an angle of about 90° with the elbow axis.

21. (Amended) A manipulator according to claim 19, wherein the shoulder axis comprises at least a first rotary shaft and a second rotary shaft, the first rotary shaft being coupled to the first member and the second rotary shaft being coupled to the second member, the compensating means comprising a first eccentric coupled to the first rotary shaft and a second eccentric coupled to the second rotary shaft, first and second spring means being coupled to the first and the second eccentric respectively, the eccentrics being directed such that at the maximally reachable horizontal position of the relevant arm part, the force exerted on the relevant rotary shaft by the spring means is maximal and at the maximally reachable vertical position of the relevant arm part, said force is minimal.

22. (Amended) A manipulator according to claim 21, wherein the spring means comprise a first and a second compression or tension spring which are at least substantially accommodated in the

foot part, with a first and a second band-shaped element respectively extending from the springs over the first and second eccentric respectively, the end distal from the relevant spring being fixed in position, the arrangement being such that upon rotation of an eccentric by means of the relevant rotary shaft, the relevant spring changes in length.

23. (Amended) A manipulator according to claim 19, comprising a gripper connected to the upper arm, wherein the drive means, in particular motors for moving the upper arm, lower arm and gripper are provided in the foot part.

24. (Amended) A manipulator according to claim 23, wherein a third member is provided, to be referred to as a wrist, included between the second member and the gripper, drive means for the wrist being included in the foot part.

25. (Amended) A manipulator according to claim 19, wherein the drive means comprise a series of motors, each motor being coupled to a reduction casing aligned therewith, the reduction casing being connected to a drive wheel connected, via transmission means, to one of a number of drive shafts, included in or adjacent a shoulder, of parts to be driven, in particular the members such as upper arm, lower arm, wrist or gripper.

26. (Amended) A manipulator according to claim 25, wherein a number of reduction cases are mutually identical, each connected to a drive shaft mounting the relevant drive wheel, the assemblies of reduction casing and drive wheel differing from each other only by the position of the drive wheel relative to the relevant motor.

27. (Amended) A manipulator according to claim 19, wherein at least the first member is at least partially hollow, a series of first drive shafts extending from the foot part into the first member, a series of second drive shafts being provided in the second member, said drive shafts being fitted coaxially one within the other, while between the shafts, a number of bearing means are included or formed, a number of the first shafts at the end remote from the foot part being provided with a first drive wheel, while a number of the second shafts are provided with a second drive wheel, a first drive wheel in each case being drivingly connected, via a coupling element, to a second drive wheel, the drive means in the foot part being arranged for driving the respective first drive shafts, the arrangement being such that both the first member and the second member are movable via the first drive shafts.

28. (Amended) A manipulator according to claim 27, wherein the second member comprises a series of third shafts, whose longitudinal direction extends approximately at right angles to the longitudinal direction of the second shafts, a number of the second and third shafts being provided with mating, preferably frustoconical gears for transmitting rotational movements of the relevant second shafts to the relevant third shafts, at least a number of the third shafts being connected to a third member to be referred to as a wrist, movably connected to the end of the second member remote from the first member.

29. (Amended) A manipulator according to claim 28, wherein the gripper is provided on the side of the wrist remote from the first member and is biased in an open position, while a spring element extends through the wrist, on one side connected to a block slidable in longitudinal direction of the first member through rotation of one of the third shafts, and on the other side

connected to the gripper, such that upon rotation of the relevant third shaft, the block is displaced in longitudinal direction while displacing the spring element and/or changing the length thereof, enabling the gripper to be pulled from the open position into a closed position and vice versa.

30. (Amended) A manipulator according to claim 19, wherein the foot part comprises a foot plate which, by means of a bearing, is rotatably connected thereto adjacent the lower end of the foot part, a number of sliding contacts being provided for transmitting an electric tension between the drive means and a power supply located outside the foot part, and a control unit.

31. (Amended) A manipulator according to claim 30, wherein the bearing for the foot plate comprises an annular groove in the outer circumference of the foot plate and a corresponding annular groove on an inner surface of a tube of the foot part, the relevant outer circumference of the foot plate being substantially identical to the relevant inner circumference of the tube and both grooves having a substantially V-shaped section, such that the two grooves together define a ball track of a substantially rectangular, in particular square or diamond-shaped section which includes a series of balls whose describing line corresponds to said section of the ball track.

32. (Amended) A manipulator according to claim 31, wherein an opening is provided in the tube, said opening ending in the ball track and having a passage which is approximately equal to the cross section of the balls, closing means being provided for closing said opening after insertion of the balls.

33. (Amended) A manipulator according to claim 19, wherein the foot part is substantially

formed from a substantially tubular extrusion section, recesses being provided for the drive means.

34. (Amended) A manipulator according to claim 19, wherein spaces are provided in the foot part for accommodating spring means for compensating means, electronic components and the ~~like~~.

35. (Amended) Use of a manipulator according to claim 19 in a space unsuitable for human entry, such as a radiation space or a toxic space.

Please add new claims 36-53 as follows:

--36. A manipulator according to claim 19, wherein the lower arm is rotatable at least 360° about the elbow axis.

37. A manipulator comprising, in combination:

a foot;

an upper arm rotatable at least 360° about a shoulder axis relative to the foot;

a lower arm rotatable about an elbow axis relative to the upper arm;

a gripper connected to the lower arm;

motors for moving the upper arm, lower arm and gripper, each motor being provided in the foot; and

a pair of eccentrics in the foot that at least partially compensate for the moments exerted by the upper arm as it moves about the shoulder axis relative to the foot and by the lower arm as

it moves about the elbow axis relative to the upper arm such that couples acting on the motors during use are limited.

38. A manipulator according to claim 37, wherein the shoulder axis and the elbow axis extend substantially parallel to each other during use, and are located adjacent opposite ends of the upper arm, the gripper being rotatable about at least a first gripper axis relative to the lower arm, the first gripper axis preferably enclosing an angle of approximately 90° with the elbow axis.

39. A manipulator according to claim 37, wherein the shoulder axis comprises at least a first rotary shaft and a second rotary shaft, the first rotary shaft being coupled to the upper arm and the second rotary shaft being coupled to the lower arm, the eccentrics comprising a first eccentric coupled to the first rotary shaft and a second eccentric coupled to the second rotary shaft, first and second spring members being coupled to the first and the second eccentrics, respectively, the first and second eccentrics being oriented such that at a maximally reachable horizontal position of the corresponding one of the upper arm and lower arm, a force exerted on the relevant rotary shaft by the corresponding spring member is maximal and at the maximally reachable vertical position of the corresponding one of the upper arm and lower arm, said force is minimal.

40. A manipulator according to claim 39, wherein the spring members comprise a first and a second spring that are at least substantially accommodated in the foot, with a first and a second band-shaped element extending from the first and second springs, respectively, over the first and second eccentrics, respectively, an end of each band-shaped element distal from the relevant

spring being fixed in position, such that upon rotation of each eccentric by means of the relevant rotary shaft, the relevant spring changes in length.

41. A manipulator according to claim 37, further comprising a wrist provided between the lower arm and the gripper, a motor for the wrist being included in the foot.

42. A manipulator according to claim 37, wherein each motor is coupled to a reduction casing aligned therewith, each reduction casing being connected to a drive wheel that is connected to one of a plurality of drive shafts.

43. A manipulator according to claim 42, wherein a plurality of the reduction casings are mutually identical, each connected to a drive shaft mounting the relevant drive wheel, each paired reduction casing and drive wheel differing from each other paired reduction casing and drive wheel only by the position of the drive wheel relative to the relevant motor.

44. A manipulator according to claim 37, wherein at least the upper arm is at least partially hollow, a series of first drive shafts extending from the foot into the upper arm and fitting coaxially one within the other, a series of second drive shafts being provided in the lower arm and fitting coaxially one within the other, a plurality of bearings being positioned between the drive shafts, a plurality of the first drive shafts having a first drive wheel at an end remote from the foot, at least one of the second shafts being provided with a second drive wheel, a first drive wheel in each case being drivingly connected, via a coupling element, to a second drive wheel,

the motors in the foot being arranged for driving the respective first drive shafts, such that both the upper arm and the lower arm are movable via the first drive shafts.

45. A manipulator according to claim 44, wherein the lower arm includes a series of third drive shafts whose longitudinal direction extends approximately at right angles to a longitudinal direction of the second drive shafts, at least one of the second and third drive shafts being provided with mating frustoconical gears for transmitting rotational movements of the relevant second drive shafts to the relevant third drive shafts, at least one third drive shaft being connected to a wrist movably connected to an end of the lower arm remote from the upper arm.

46. A manipulator according to claim 45, wherein the gripper is provided on a side of the wrist remote from the upper arm and is biased in an open position, a spring element extending through the wrist and connected on one side to a block slidable in a longitudinal direction of the upper arm through rotation of one of the third drive shafts and on the other side to the gripper, such that upon rotation of the relevant third drive shaft the block is displaced in the longitudinal direction while displacing the spring element, enabling the gripper to be pulled from the open position into a closed position and vice versa.

47. A manipulator according to claim 37, further comprising a foot plate rotatably connected by a bearing to a lower end of the foot and including a plurality of sliding contacts to provide electrical contact between the motors, a power supply, and a control unit.

48. A manipulator according to claim 47, wherein the bearing for the foot plate comprises an annular groove in an outer surface of the foot plate and a corresponding annular groove on an inner surface of a tube of the foot, both grooves having a substantially V-shaped section such that the two grooves together define a ball track of a substantially rectangular-shaped section, a series of balls being provided in the ball track.

49. A manipulator according to claim 48, wherein an opening is provided in the tube, said opening ending in the ball track and having a passage with a width approximately equal to a diameter of the balls, a stop being provided for closing said opening after insertion of the balls.

50. A manipulator according to claim 37, wherein the foot is formed from a substantially tubular extrusion section, recesses being provided in the foot to receive the motors.

51. A manipulator according to claim 37, wherein spaces are provided in the foot for accommodating spring members for the eccentrics and electronic components.

52. Use of a manipulator according to claim 37 in a space unsuitable for human entry.

53. A manipulator according to claim 37, wherein the lower arm is rotatable at least 360° about the elbow axis.--